



REELEST
MODEL C1A

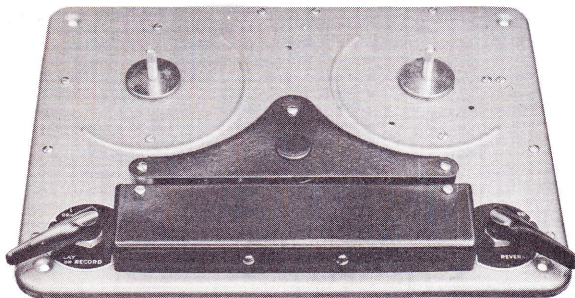


Figure 1



Figure 2

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GENERAL INFORMATION

The UNIVERSAL REELEST TAPE RECORDER is designed to magnetically RECORD-REPRODUCE two parallel tracks in opposite direction on 1/4" wide magnetic recording tape. The tape operates at a constant speed of 7 1/2" per second and is automatically reversed by means of a contact sticker which must be applied to the tape. The machine features manual and automatic reverse and fast winding in either direction by operating two control levers. Provision is made for 7" diameter reels which records or reproduces without rethreading. The unit operates only on 115 V, 60 Cycles A. C.

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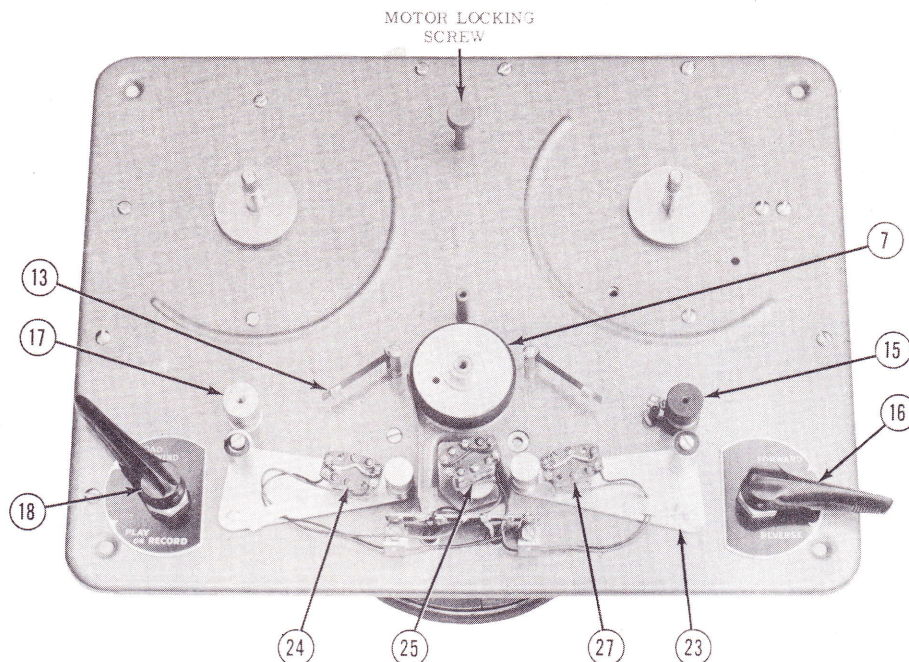


Figure 3

OPERATING INSTRUCTIONS

Before the unit can be placed into operation, the red motor locking screw must be removed. This post anchors the motor and separates precision ground driving surfaces when machine is idle or being carried. Replace this screw when recorder is not in use and do not operate right-hand lever (16) to forward position with screw in place.

Record-Play Head:

The "Record-Play" head (25) is mounted in such a manner as to allow it to move up when tape is traveling in the "Forward" direction, (from right to left) and down when in "Reverse," resulting in two tracks of recording - one in each direction, one above the other. This head (25) either plays or records, depending on amplifier setting, or retracts for loading or high speed rewind depending upon the position of play-record control (18).

Erase Heads:

The two outer heads (24) are arranged in such a manner that the right head erases the "upper, forward track" and the left head erases the "lower, reverse track". The motor control lever (16) automatically selects the correct head to accomplish any desired erasure. The erase heads are normally energized only when the amplifier is in the "Record" position.

Threading of Tape:

1. Turn the control knob (18) to the "Tape Out" or "Load or Rewind" position. This operation pivots the right and left-hand erase heads (24) and the recording head (25) away from their play position. This provides clearance for threading the tape.

2. Place a full reel of tape on the platform (5A) in a position so that the tape will unwind in a clockwise

direction. The coated side of the tape should face outward on the reel. The coated side of the tape is the dull side of Plastic tape.

3. Pull the tape through the slot between the rear bezel (3) and the front bezel (10).

4. Place an empty reel on the takeup reel platform (5) and feed the end of the tape up through one of the slots in the reel. Hold the end of the tape and rotate the reel, in a clockwise direction, four or five revolutions. Make sure the coated side of the tape is always facing outward and untwisted.

Recording:

1. To make a recording, turn the control knob (18) to "Tape In" or "Play or Record" position. This pivots the erase heads (24) and recording head (25) into their normal playing position. Do not force this knob for it is spring loaded to assume the proper position as the motor is started.

2. Turn the control knob (16) to "Forward" position. This starts the unit and also moves the recording head (25) to the upper half of the recording tape.

(a) The tape moves at a fixed rate of speed (7.5" per second) past the recording head (25) due to the position of the erase heads; i.e., when the control knob (18) is set up for "Tape In" or "Play or Record". The erase heads, in this position, hold the tape in contact with capstan surface which, as a result, sets up a positive frictional condition between the tape and capstan. Since the R. P. M. of the capstan is much slower than that of the takeup reel and its associated parts, the resistance set up by the capstan causes the diaphragm (72) of the clutch assembly to slip a corresponding amount. This

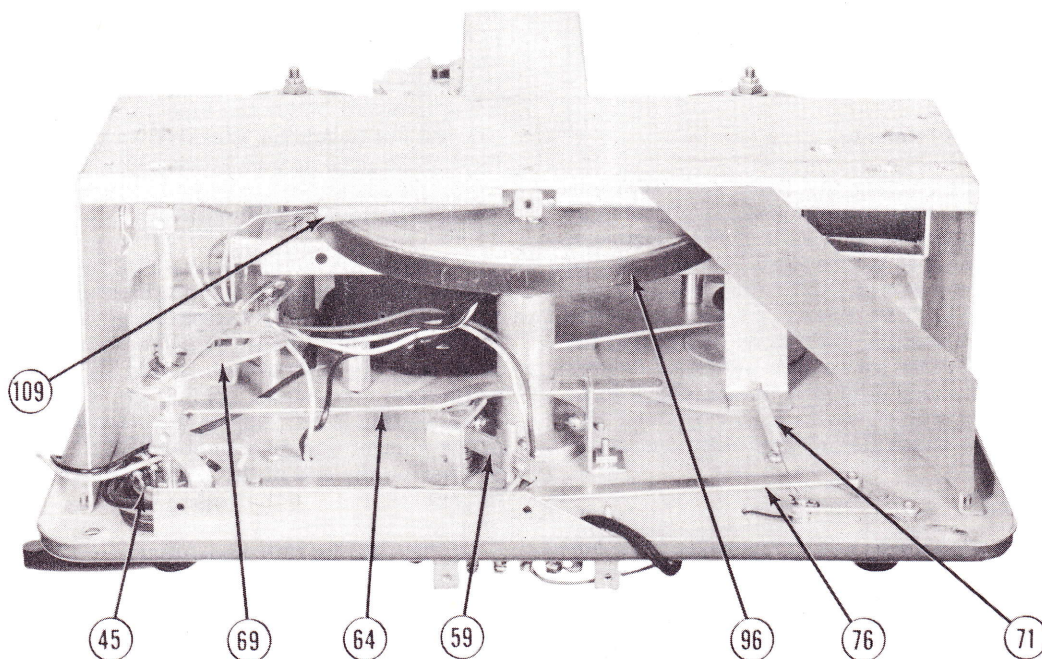


Figure 4

accounts for the highspeed winding when this friction condition is released at the time the control knob (18) is turned to the "Tape Out" or "Load or Rewind" position.

- (b) The Revers-A-Matic sticker is placed on the back of the tape wherever the customer desires; therefore, with the unit operating in a forward position, the metallic coating contacts the reversing switch (15) and shorts it. This energizes the solenoid which switches the mechanism from "Forward" to "Reverse".

Fast Speed Winding:

Fast speed winding may be accomplished by turning the control knob (18) to the "Tape Out" or "Load or Rewind" position. This action removes the drag set up between the tape and capstan (7) allowing the clutch assembly to operate without slipping. Reversing the direction of the tape at high speed may be done at will without spillage of the tape. Non-spilling of the tape is credited to the brake assembly (102), (104), and (112). Pressure is applied to clutch assemblies (74), by the brake assembly, as the control knob (16) passes the neutral or "Off" position when it is switched from "Forward" to "Reverse", or vice versa. This neutral position of the control assembly stops the reels instantly, preventing any overrun of the reels. Because the braking action is applied to the reels through the clutches, tape breakage is minimized.

To Repair or Slice Tape:

In case the tape is broken accidentally, or it is desired to edit the recording, a splice may be made special with "Scotch" S-41 Splicing tape. Do not use medical adhesive tape as the adhesive material is not suitable for this purpose. The "Scotch" Splicing tape should be applied to the reverse, or uncoated, side of

the recording tape. To assure proper operation of the unit, the edges of the splice should be trimmed with a small pair of scissors, or a knife, to bring the width of the splice to that of the rest of the recording tape or slightly less.

It is recommended not to use a lubricated tape as it may slip on the rubber capstan (7) causing "Wow" in the recorded sound. Consult your dealer for a list of approved tapes.

Cleaning Recording Head:

After the recorder has been in use for some time, the many thousands of feet of tape passing over the magnetic heads may have deposited a film of gum, dust and dirt on the magnetizing section. This film will reduce the efficiency of the recorder.

To clean this film from the three magnetic heads, remove the three screws (2) and the housing (3). Now, set the control lever (18) in position halfway between "Record or Play" and "Load or Rewind." This will place the recording magnet at the edge of the slot. Moisten a clean cloth with carbon tetrachloride and gently rub the surfaces of the recording heads. The capstan tire surface should also be cleaned with carbon tetrachloride, holding a moistened cloth against the neoprene surface with the machine running. Replace housing and screws.

MECHANICAL OPERATION AND ADJUSTMENTS

Forward Pulling Spring Adjustment:

The proper motor pressure applied to the main drive wheel (96), when in the "Forward" position, is adjusted by means of the "Flexloc" nut on the spade screw (65), located on the cam follower assembly (63). Measure this pressure with spring scale hooked on the rear lip of the right-hand motor support bracket (40) as close to the motor as possible. With the motor

running in the "Forward" position, pull the spring scale back until the capstan (7) slips; then read the scale. Pressure measured with tape loaded and running should be 4 1/2 to 5 lbs. Adjust the "Flexloc" nut until the proper pressure is obtained.

Rear Idler Wheel Adjustment:

With the motor running in "Reverse" direction, the rear idler wheel and bracket (101) is adjusted by loosening the two mounting screws (110A), figure 4, and sliding the bracket to the left (facing the rear of the machine) until the cam follower (63) has approximately 1/16" slack. The idler wheel must be horizontally aligned with the main drive wheel (96) for proper performance. Be sure the adjusting screws are tight after the adjustment is made; check to be sure that rear idler wheel does not contact the neoprene oil catcher on the motor shaft while operating.

Clutch Adjustment:

The clutch assemblies (diaphragm and hub assemblies (72), and clutch wheel (74) slip relative to each other due to the speed difference between the capstan and the clutch assembly. The friction between tape and capstan produces the drag forcing the clutch to slip; however, when this friction is removed by turning the control knob (18) to "Tape Out", there should be enough friction in the clutch assemblies to drive the reels at high speed. The following procedure is necessary to check and adjust the clutch assembly. With the motor running, check the pressure of the clutch with a spring scale hooked on to the reel at approximately a 3" radius and held at right angles to the reel spoke. Correct adjustment should read 3 1/2 to 4 1/2 oz. The clutch pressure is varied by adjusting the "Flexloc" nut (85).

Brake Shoe Adjustment:

The brake shoes (102) must be adjusted to stop the reels immediately when the control knob (16) is placed in the neutral or "Off" position.

The brake shoes (102) are adjusted by loosening the screw which secures them to the brake arm assembly (112). With the machine in a neutral position, move the brake shoe in to contact the clutch wheel firmly; then tighten the screw.

Brake pressure applied to the clutch wheel should be just enough to stop the reels immediately; too great a pressure may cause the shoes to drag on the clutch wheels while in playing position.

Tape Level Adjustment:

With the tape loaded and running, and with the control knob (18) in the "Tape In" or "Play or Record" position, the edge of the tape should run approximately 1/32" above the bottom edge of the capstan rubber (7) in both directions. To adjust the tape position as required carefully bend the tape arms (22) and (23) until proper adjustment is obtained.

Pressure Pads:

The pressure pads (13) apply just enough pressure to the tape to hold them against the erase heads (24). The pressure pads should be depressed approximately 1/8" when the mechanism is in playing

position ("Tape In" or "Play or Record"), and should be vertical and flat against the erase heads. The pressure pads are adjusted by loosening their mounting screws (13B) and rotating pads to correct position; then tighten screws. If a high frequency mechanical noise is heard when the tape is running, this may be damped out by adding adhesive tape to the rear surface of the pressure pad assembly (13).

Automatic Reverse Adjustment:

The solenoid (111) should be adjusted so that the machine will cycle automatically, from "Forward" to "Reverse", every time the reversing switch (15) is actuated. To adjust the solenoid, remove the power plug, turn the control knob (16) to "Forward" position, and loosen the screws holding the solenoid bracket to the mounting base. Adjust the solenoid so that the end of the plunger is approximately 1/32" from the rubber bumper on the end of the brake driving link; tighten the screw.

The spring (80) and bracket (78) must also be adjusted properly to assure definite reversing operation. The spring and bracket, which hold the self-energizing wheels (90) in contact with the clutch wheel (74), help to switch the oscillating bracket (88). Adjust the spring so that it is vertical in respect to the head lifting link (64) when the machine is in the "Off" position. In late production, two of these springs (80) are used. This is to give a more positive or definite reversing action to the mechanism.

TROUBLES

Failure to Reverse Automatically:

1. Check power source 6.3 volts by shorting the reversing switch (15). Short metal rings of the switch (15) and listen for hum in solenoid (111).
2. Excessive brake pressure. See "Brake Shoe Adjustment".
3. Solenoid out of adjustment, thereby not actuating the brake driving link (104). See "Automatic Reverse Adjustment".
4. Spring (80) broken or out of adjustment. See "Automatic Reverse Adjustment".
5. Check mechanism for binding parts.

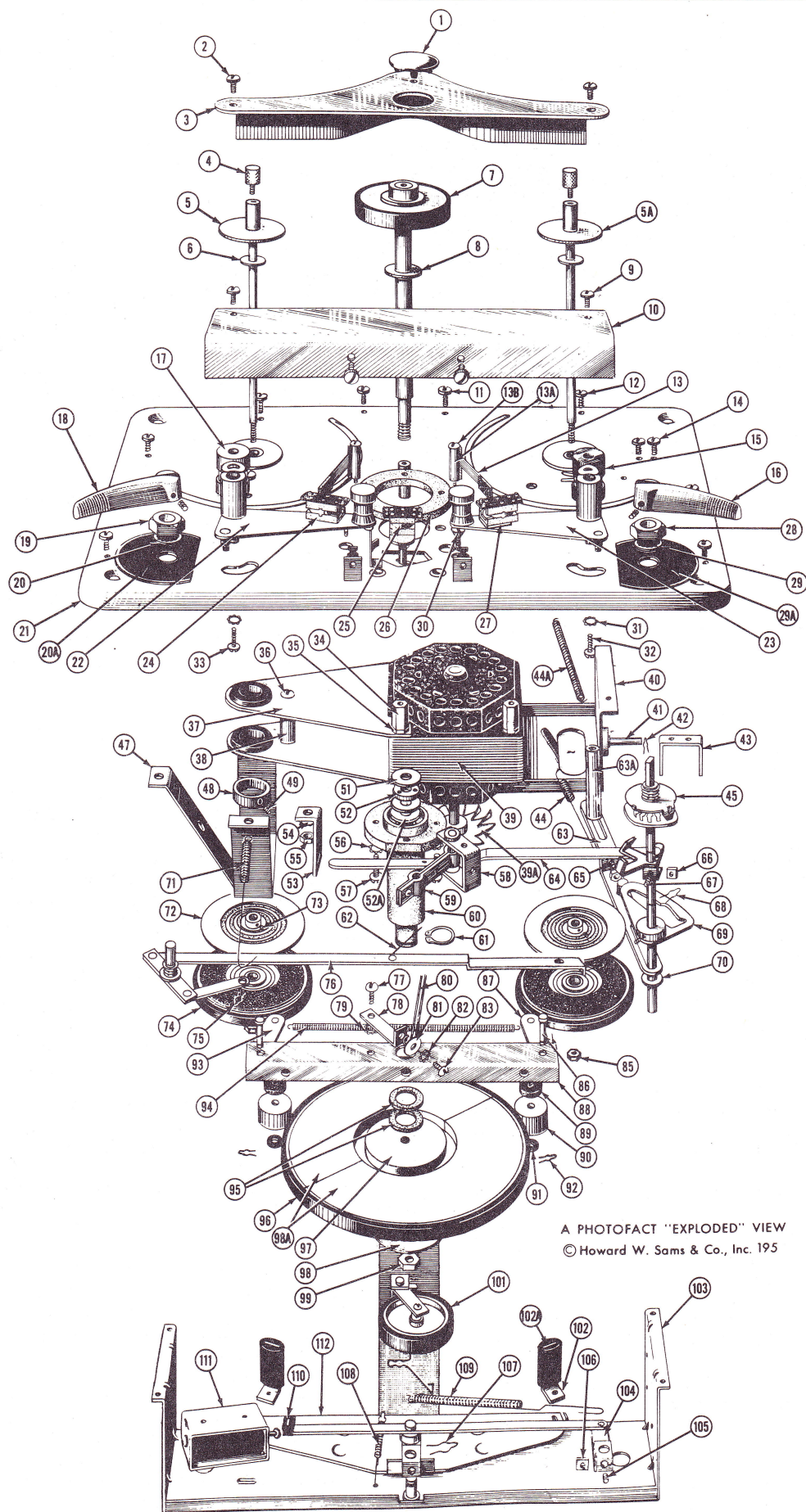
Machine Shuts off at End of Tape Instead of Reversing Operation:

1. Spring (44A) loose, thereby not pulling the motor and bracket assembly around, leaving the switch in the neutral or "Off" position.
2. Check for binding parts.
3. Check metallic coating on back of tape.

Speed Variation or Wow:"

1. Check the motor shaft, driving wheels (90), clutch wheels (74), main drive wheel (96), and rear idler (101), for oil and foreign material. Clean with carbon tetrachloride.
2. Brake pressure adjustment too great. If this is true, the brake shoes may drag on the clutch wheels (74). See "Brake Shoe Adjustment".

REELEST
MODEL CIA



A PHOTOFACT "EXPLODED" VIEW
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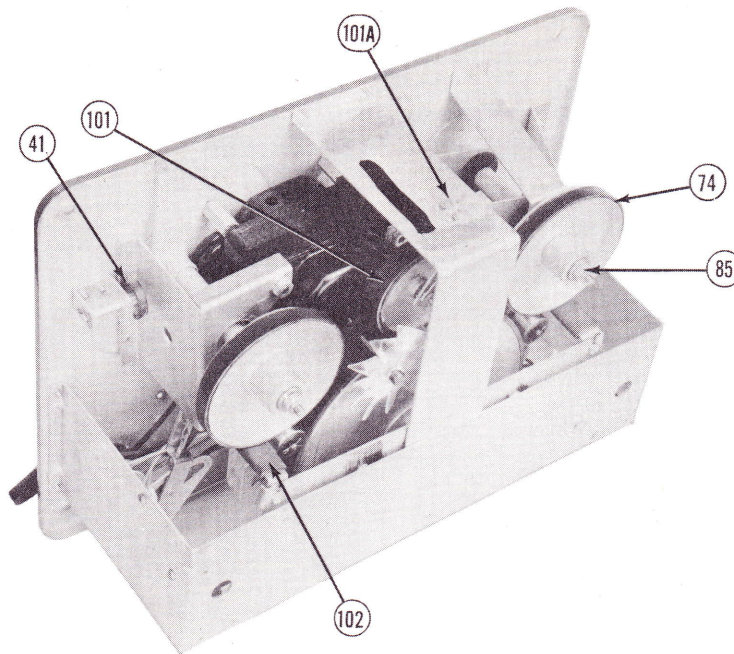


Figure 5

3. Spring (108) loose, leaving the brake arm in a forward position. If this condition exists, it may allow the brake shoes to drag on the clutch wheels (74). It also prevents the machine from winding at high speed, producing a loud hum due to this drag.

4. Tape arm spring (71) loose. If this is true, the erase heads are not held in their play position, which results in the tape not being held in constant contact with the capstan (7).

5. Spring (80) loose; this, as a result, lessens the pressure of the self-energizing wheels (90) against the clutch wheels.

Failure to Erase:

1. Tape arm spring (71) loose. If this is true, the laminations of the erase heads will not be held in a positive position against the tape.

2. With the tape running in the "Forward" position, the top of the laminations on the right-hand erase head should be level with top edge of the tape. The top of the recording head laminations (25) should be $1/64$ " below the top of the tape.

3. With the tape running in the "Reverse" position, the bottom of the left-hand erase head laminations is level with the bottom of the tape. The recording head in "Reverse" position should be $1/64$ " above the lower edge of the tape.

4. Pressure pads (13) out of adjustment. See adjustment on "Pressure Pads".

5. Check resistance of erase head... should be approximately 160 ohms. Check voltage source.

Failure to Record:

1. Tape arm spring (71) loose... not holding

recording head (25) against tape.

2. Spring of the recording head bracket and clamp assembly (58 and 59) broken.

3. Laminations on the recording head dirty. The laminations of the recording head (25) and the erase heads (24) are subject to an accumulation of tape coating residue, which is worn off the tape as it passes the heads. This must be periodically removed since it will cause distortion. This accumulation may be removed with carbon tetrachloride and a small cotton swab on the end of a toothpick. Be careful not to mar the laminations as they should be smooth to operate properly. (See Paragraph on "Cleaning Recording Head").

CAUTION: Do not tamper with the adjustment of the Recording Head, as it is a critical adjustment and has been correctly positioned at the time of manufacture. If, however, head replacement is necessary refer to the following.

Replacement or Realignment of Record Head

The record-playback head in the PT-3 unit has been adjusted at the factory for perfect alignment. This assures that the gap in the head is perpendicular to the edge of the tape and is parallel to face of the tape and capstan.

If due to excessive wear of the contact surface of the head laminations, head replacement is indicated, the head being symmetrical front to back, may be removed and turned around 180° . This provides twice the life of a single face head.

If a head is found to be open or shorted when checked with an ohmmeter it must be replaced. With the red and black lead wires removed from head the resistance of entire head (both coils) should be approximately 160 ohms or 80 ohms from each terminal to connecting link (one coil). No reading

should exist from any terminal to frame.

Procedure:

To replace head, remove red and black wires from terminal panel on top of head, then remove 4 corner screws. Do not disturb 2 center screws as they hold the head assembly together. If head is to be turned around for use of rear side, remove piece of metal cemented to back surface of head frame if present. This is applied for hum bucking and must be replaced on the rear of head after it is reconnected and adjusted.

New head or reversed head may now be placed back on head platform and 4 screws replaced in corner holes. Do not completely tighten these screws at this time. Replace red and black leads to head terminals. A tape with a 5000 cycle tone recorded precisely perpendicular to the edge must be used for alignment. (This tape is available from Service Dept).

With alignment tape loaded in PT-3 machine in normal manner and a suitable output meter in amplifier circuit, the head must now be rocked from side to side by means of the mounting screws. The head platform has a raised dimple in the center and the head will move from side to side and from front to back by successively loosening and tightening the four mounting screws. The output meter will read maximum when the head is in exact line with the recording on the tape. When this is attained the head is in perfect alignment and screws may be secured with household cement to prevent any further movement of the head.

Hum Bucking

This process minimizes the effect that the magnetic field of the motor has on the recording head. Hum bucking is accomplished by strategically locating a small piece of Mu-metal on the rear side of the recording head. Hum bucking should be done with PT-3 unit, amplifier and power transformer in the final operating position.

Procedure:

With the red motor positioning post in place so that the capstan does not turn, turn left hand control knob (18) to "Play or Record" position, then turn right hand knob (16) to "Reverse" position. The head will be in its operating position without movement of the capstan which might be damaged without tape.

Insert a suitable output meter across the speaker so that a reading can be taken along with a listening test. If PT-3 tape recorder is used with a C1A Reelest Amplifier, set volume control at the tap. The tap can be located by finding the position of the control where the tube hiss and hum are at a minimum in the speaker and on the meter.

With the motor running hold Mu-metal piece flat against the top casting of the record head just below the terminal panel. Move Mu-metal piece back and forth from the center gap in the lamination until the hum in speaker and the output meter is at a minimum. Cement Mu-metal piece at this place.

LUBRICATION

Lubrication applied at time of manufacture is

sufficient for a long period of time; however, due to excessive use or high-operating temperatures, lubrication should be applied in the following manner:

Use Sta-Put on the Following:

1. Felt washer under reel platform.
2. Washers (51) and ball race (52) of the capstan shaft.
3. Cam roller and all sliding contact surfaces of the cam (69) and cam follower (63).
4. Sliding contact areas of the brake arm assembly and all movable link assemblies.
5. Head lifting link guide bracket (53).

Use Light Spindle Oil on the Following:

1. Head lifting bracket bearing (58).
2. Roller and shaft of the brake arm and roller assembly.
3. Felt pads (89) of the self-energizing idler wheels (90). The felt pads on the clutch wheel face to be lubricated with powdered graphite.

CAUTION: Avoid overlubrication; this may cause parts to stick or failure of the machine to operate properly.

Do not oil the motor shaft or any of the rubber surfaces of the various wheels. Oil at these points may cause speed variation or "Wows."

In summary, it is suggested that the following procedure be followed for checking a PT-3 Recorder mechanism:

1. With an amplifier properly connected to the PT-3 unit supplying bias, erase, and solenoid voltages, place a roll of tape on the right hand reel platform and thread for proper operation.
2. Start machine by placing right hand lever in forward position.
3. Stall right hand reel for check on capstan driving power. Left hand lever should move forward showing that the friction between capstan and tape is correct. If left hand lever does not move, residue is present on capstan and should be removed with carbon tetrachloride or equivalent. Repeat above on left hand reel with right hand lever in reverse.
4. If tape has a tendency to form a loop between the capstan and the moving tape guides, tape is too wide. Wide tape may be returned to dealer for credit.

An A. C. Vacuum tube voltmeter with high resistance input should be used. (Vomax or equivalent) A fibre padding screw driver should be used for adjusting. Oscillator padder is nearest 6SN7 tube and Erase padder is nearest 6V6 tube.

1. Turn oscillator padder and erase voltage padder all the way in a clockwise direction, then back off in a counter clockwise direction 4 or 5 turns. Remove front bezel and connect Vacuum tube Voltmeter

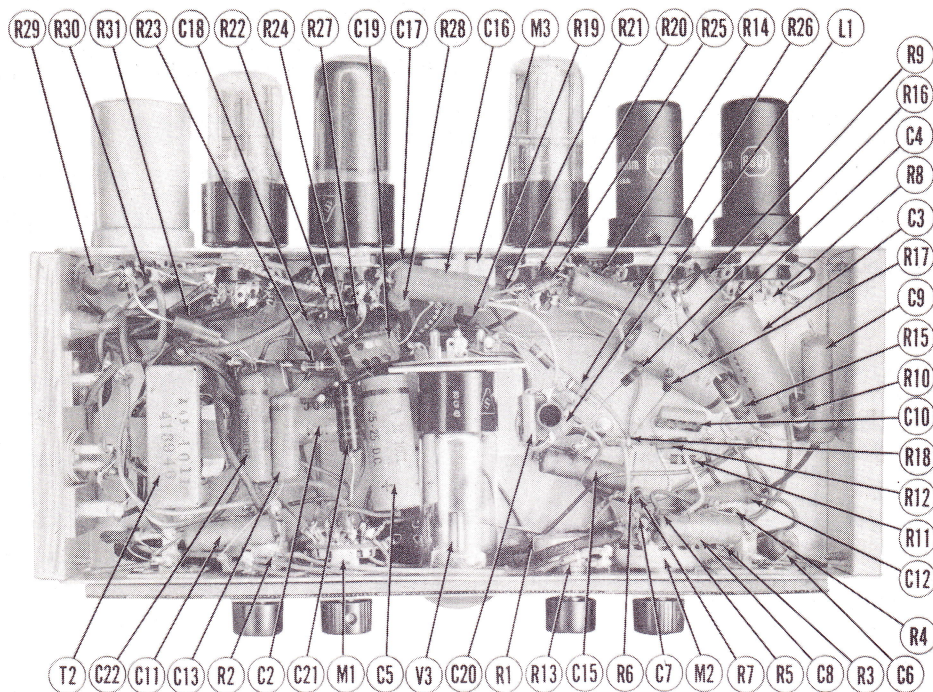


Figure 6

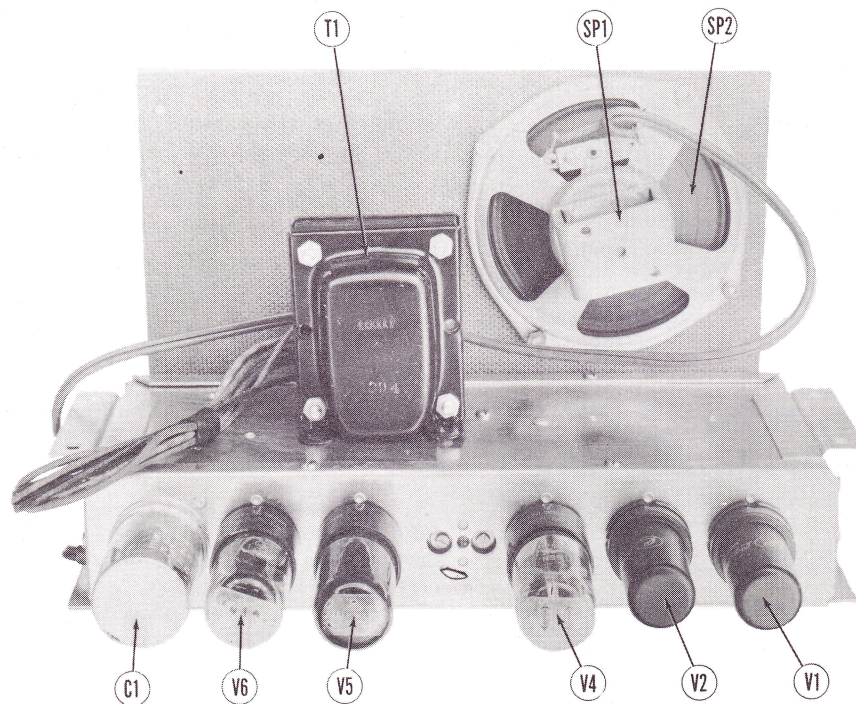


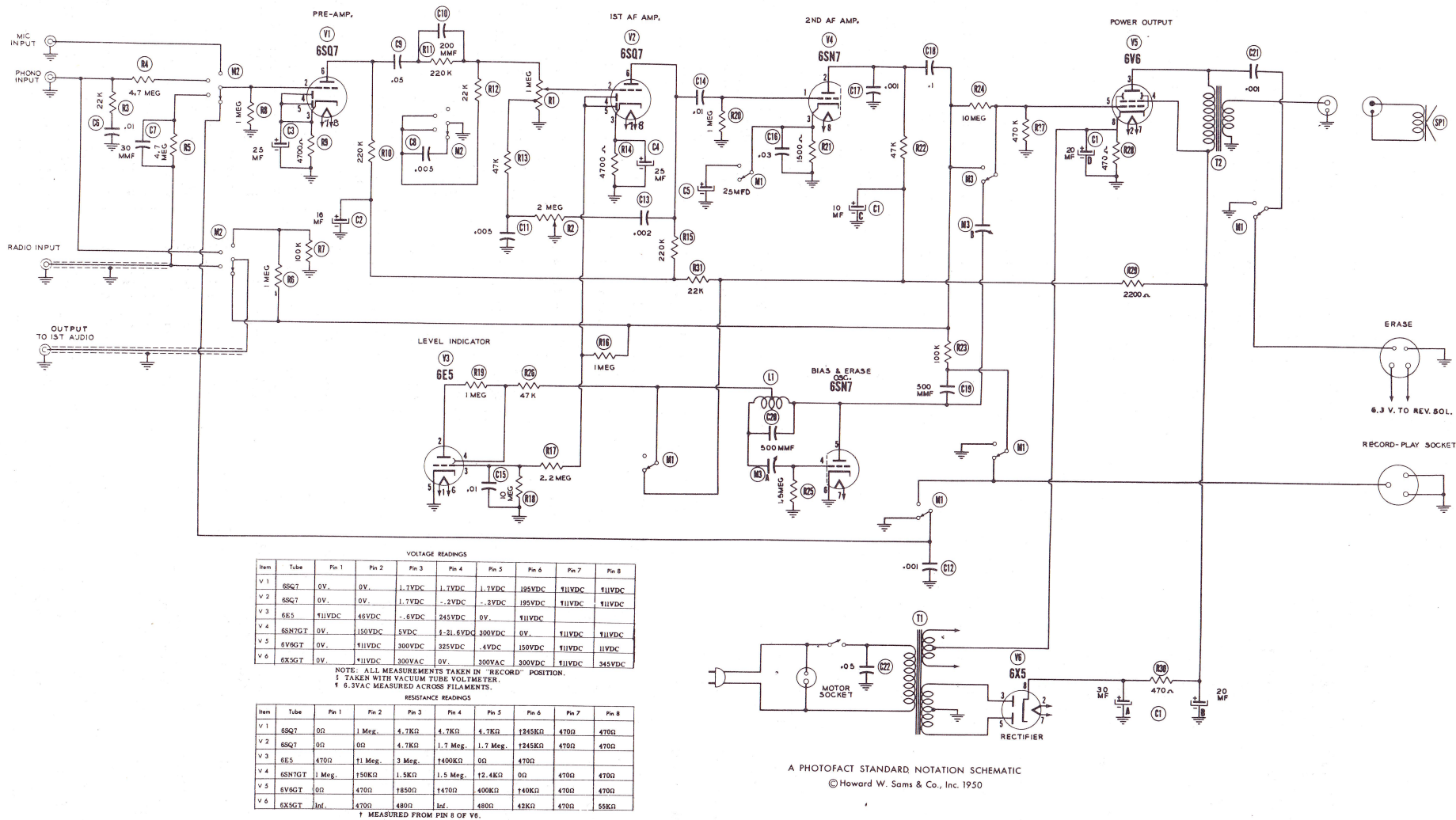
Figure 7

to recording head terminals which are on the extreme left hand end of front terminal strip. The high side of V. T. V. M. should be connected to the red lead. Use 120 V. A. C. scale.

Gradually rotate oscillator padder clockwise until meter starts to read. Continue turning padder until a maximum reading is obtained. This is the proper adjustment (approximately 90 V. A. C.). If padder is turned beyond this point, oscillator voltage will fall off and result in poor wave form.

2. Connect V. T. V. M. ground side to extreme right hand terminal on terminal strip which is ground side of erase circuit. Connect high side of V. T. V. M. to yellow lead terminal. With right hand control lever in either direction so that an erase head is connected for a load, rotate erase padder clockwise. On the 300 volt ac scale, meter should read full 300 volts.

REELIST MODEL CIA



ELECTRICAL PARTS LIST

Item No.	Part No.	Use and Description	Item No.	Part No.	Use and Description
V1	46-6SQ7-MET.	6SQ7, Pre Amp.	R3	41-3223540	Tone Compensation, 22K, 1/2 Watt
V2	46-6SQ7-MET.	6SQ7, 1st AF Amp.	R4	41-5473540	Series Phono Input, 4.7 Meg., 1/2 Watt
V3	46-6E5	6E5, Level Indicator	R5	41-5473540	Series Radio Input, 4.7 Meg. 1/2 Watt
V4	46-6SN7-GT.	6SN7GT, 2nd AF Amp. - Bias and Erase Osc.	R6	41-5103540	Ext. Audio Shunt, 1 Meg., 1/2 Watt
V5	46-6V6-GT.	6V6GT, Power Output	R7	41-4103240	Ext. Audio Shunt, 100 K, 1/2 Watt
V6	46-6X5-GT.	6X5GT, Rectifier	R8	41-5103540	Pre Amp Grid, 1 Meg., 1/2 Watt
C1A		Filter, 30 Mfd @ 400 V., Electrolytic	R9	41-2473540	Pre Amp Cathode, 4700 Ohms, 1/2 Watt
C1B		Filter, 20 Mfd @ 350 V., Electrolytic	R10	41-4224540	Pre Amp Plate, 220 K, 1 Watt
C1C	A38-1003-B	Filter, 10 Mfd @ 350 V., Electrolytic	R11	41-4223540	Tone Compensation, 220 K, 1/2 Watt
C1D		Output Cathode Bypass, 20 Mfd @ 250 V., Electrolytic	R12	41-3223540	Tone Compensation, 22 K, 1/2 Watt
C2	A38-1004-A	Decoupling, 16 Mfd @ 300 V., Electrolytic	R13	41-3473540	Tone Compensation, 47 K, 1/2 Watt
C3	A38-1001	Pre Amp. Cathode Bypass, 25 Mfd @ 25 V., Electrolytic	R14	41-2473540	1st AF Amp. Cathode, 4700 Ohms, 1/2 Watt
C4	A38-1001	1st AF Amp. Cathode Bypass, 25 Mfd @ 25 V., Electrolytic	R15	41-4224540	1st AF Amp. Plate, 220 K, 1 Watt
C5	A38-1001	2nd AF Amp. Cathode Bypass, 25 Mfd @ 25 V., Electrolytic	R16	41-5103540	Level Indicator Net, 1 Meg., 1/2 Watt
C6	37-01004000	Tone Compensation, 01 Mfd @ 600 V.	R17	41-5203540	Voltage Divider, 2.2 Meg., 1/2 Watt
C7	39-00306400	Tone Compensation, 30 Mmf @ 500 V.	R18	41-6103540	Level Indicator Grid, 10 Meg., 1/2 Watt
C8	37-00504400	Tone Compensation, .005 Mfd @ 600 V.	R19	41-5103540	Level Indicator Grid, 1 Meg., 1/2 Watt
C9	37-05004000	Audio Coupling, .05 Mfd @ 400 V.	R20	41-5103540	2nd AF Amp. Grid, 1 Meg., 1/2 Watt
C10	39-10206400	Tone Compensation, 200 Mfd @ 500 V.	R21	41-2153540	2nd AF Amp. Cathode, 1500 Ohms, 1/2 Watt
C11	37-00504400	Tone Compensation, .005 Mfd @ 600 V.	R22	41-3473540	2nd AF Amp. Plate, 47 K, 1/2 Watt
C12	37-00102000	Tone Compensation, 001 Mfd @ 600 V.	R23	41-4103240	Isolation, 100K, 1/2 Watt
C13	37-00204000	Tone Compensation, .002 Mfd @ 600 V.	R24	41-6103540	AF Voltage Divider, 10 Meg., 1/2 Watt
C14	37-01004000	Audio Coupling, .01 Mfd @ 600 V.	R25	41-5153540	Vias Osc. Grid, 1.5 Meg., 1/2 Watt
C15	37-01004000	Indicator Filter, .01 Mfd @ 600 V.	R26	41-3473540	Voltage Dropping, 47 K, 1/2 Watt
C16	37-03002000	2nd AF Amp. Cathode Bypass, .03 Mfd @ 400 V.	R27	41-4473540	Output Grid, 470 K, 1/2 Watt
C17	37-00102000	2nd AF Amp. Plate Bypass, .001 Mfd @ 600 V.	R28	41-1474540	Output Cathode, 470 Ohms, 1 Watt
C18	37-10004000	Audio Coupling, .1 Mfd @ 400 V.	R29	41-2225540	Filter, 2200 Ohms, 2 Watt
C19	39-10206400	Oscillator Coupling, 500 Mfd @ 500 V.	R30	41-1475540	Filter, 470 Ohms, 2 Watt
C20	39-10206400	Fixed Trimmer, 500 Mfd @ 500 V.	R31	41-3225540	Decoupling, 22 K, 2 Watt
C21	37-00109000	Output Plate Bypass, .001 Mfd @ 1000 V.	T1	A43-1010-B	Power Transformer
C22	37-05004000	Line Filter, .05 Mfd @ 400 V.	T2	A43-1011-B	Output Transformer
R1	A42-1003-B	Volume Control, 1 Meg.	SP1	B36-1004-C	Speaker, 5 PM
R2	A42-1004-B	Tone Control & On-Off Switch, 2 Meg.	SP2	B36-1004-C	Cone, 3.8 Ohms Voice Coil
			L1	B35-1004-1-C	Bias Oscillator Coil
			M1	A45-1007-C	Switch, Record-Play
			M2	A45-1008-C	Switch, Mike-Phono-Radio-Tape
			M3A	A40-1002	Trimmer, 7.5 - 50 Mmf
			M3B		Trimmer, 7.5 - 50 Mmf

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	33-1042	Plug Button-Bezel
2	1H10796FA7	Screw
3	25-1415	Rear Bezel
4	25-1262	Reel Retaining Screw
5	27-1034	Reel Shaft & Platform Assy.
5A	27-1034	Reel Shaft & Platform Assy. *
6	21-1004	Reel Shaft Washer
7	27-1054	Capstan Assembly
8	21-1003	Cork Washer
9	1H10796FA7	Screw
10	25-1277	Front Bezel
11	1H20525FA7	Screw
12	1H20525FA7	Screw
13	27-2088	Pressure Pad Assembly
13A	33-1034	Spacers
13B	1H20274FA-1	Screws
14	1H20523FA-7	Motor Support Bracket Screws
15	27-2178	Reversing Switch Assembly (Added 27-2178 as service Pt. No. Only)
15A	21-1053	Reversing Switch Base (Part of 27-2178)
15B	21-1054	Reversing Switch Post (Part of 27-2178)
15C	25-1420	Reversing Switch Washer (Part of 27-2178)
15D	21-1026	Reversing Switch Insulator (Part of 27-2178)
15E	33-1030	Reversing Switch Lug (Part of 27-2178)
16	21-1023	Control Knob (Two set Screws Included)
17	25-1414	Guide Post- Left Hand
18	21-1023	Control Knob
19	25-1502	Nut
20	1H24520FA-1	Lockwasher
20A	29-1004	Escutcheon - L. H. Knob *
21	27-1028	Motorboard Assembly
22	27-1046-1	L. H. Tape Arm Assembly
23	27-1046	R. H. Tape Arm Assembly
24	43-1005	R. H. & L. H. Erase Head Assembly
	2H10564	Screws for R. H. Erase Heads
	1H24510FA1	Lockwasher for R. H. & L. H. Erase Heads
	2H10563	Screws for L. H. Erase Heads
25	43-1006	Recording Head
26	25-1254	Capstan Bearing Housing Ring
27	25-1474	Spacer for Right Hand Erase Head
28	25-1502	Nut
29	1H24520FA1	Lockwasher
29A	29-1005	Escutcheon - R. H. Knob *
30	1H10245FA1	Screw
31	1H24256FA1	Lockwasher
32	1H10618FA1	Screw
33	1H10611FA1	Screw
34	25-1510	Shipping Nut (Part of Motor Assembly - Item 39)
35	1H24258FA1	No. 10 Lockwasher (Part of Motor Assembly - Item 39)
36	1H10646FA1	No. 8-32 Screw (Part of Motor Assembly - Item 39)
37	27-2103	Mounting Plate Assembly (Part of Motor Assembly - Item 39)
38	25-1401	Spacer (Part of Motor Assembly - Item 39)
39	27-2083	Motor Assembly (Includes Items 34-35-36-37-38-40-46-& 50)
39A	25-1590	Fan Assembly (Including Set Screw) *
40	25-1382	Mounting Plate (Part of Motor Assembly - Item 39)
41	25-1385	Motor Support Wheel Shaft
41A	27-1032	Motor Support Wheel
42	33-1002	Hairpin Clip
43	25-1383	Motor Support Wheel Bracket
44	33-1005	Cam Spring
44A	33-1006	Motor Spring
45	45-1005	Motor Switch
46	1H24257FA1	No. 8 Lockwasher (Part of Motor Assembly - Item 39) --

Ref. No.	Part No.	Description
		This part not shown in exploded view.
47	27-1055	Reel Shaft Housing Tripod
48	25-1342	Motor Collar
49	1H25849FE-6	Set Screw
50	1H20519FA1	No. 8-32 Hex Nut (Part of Motor Assembly - Item 39) This part not shown in exploded view.
51	25-1409	Hardened Bearing Washers
52		Capstan Thrust Bearing
	21-1021	Bakelite Retainer
	25-1410	Ball Bearings
52A	21-1003	Cork Washer
53	25-1423	Head Lifting Link Guide Bracket
54	1H24257FA1	Lockwasher
55	1H20248FA1	Nut
56	1H24256FA1	Lockwasher
57	1H10615FA1	Screw
58	27-2047	Head Bracket & Clamp Assembly
59	27-1063	Clamp Assembly (Part of Item 58)
60	31-1008	Capstan Bushing
61	33-1040	Truarc Retaining Ring
62	33-1008	Head Retracting Spring (Part of Item 76)
63	27-1058	Cam Follower Assembly
63A	25-1450	Cam Follower Guide Post
64	27-1081	Head Lifting Link
65	1H42676FA1	Spade Bolt
66	33-1032	Nut
67	1H25881FE26	Set Screw
68	33-1004	Hairpin Clip
69	27-2102	Cam
70	21-1004	Washer
71	33-1022	Tape Arm Spring
72	27-2107	Diaphragm & Hub Assembly
73	1H25848FE6	No. 6-32 Set Screw
74	27-1025	Clutch Wheel Assembly
75	33-1002	Hairpin Clip
76	27-1044	Tape Arm Link & Spring Assembly
77	1H21297FA1	Screw
78	25-1464	Oscillating Bracket for Vertical Spring
79	1H24256FA1	Lockwasher
80	33-1020	Oscillating Bracket Return Spring
81	1H52148FA1	Plain Washer
82	1H24256FA1	Lockwasher
83	1H21297FA1	Screw
84	25-1407	Clutch Adjusting Nut
85	25-1407	Clutch Adjusting Nut
86	25-1381	Self-Energizing Shaft
87	27-1047	Self-Energizing Bracket - R. H.
88	25-1378	Oscillating Bracket
89	21-1066	Felt Washer (Part of 27-1047)
90	27-1039	Self-Energizing Wheel (Part of 27-1047)
91	21-1020	Felt Washer (Part of 27-1047)
92	33-1002	Hairpin Clip (Part of 27-1047)
93	27-1040	Self-Energizing Bracket - L. H. (Includes same parts as 27-1047 - Item 87)
94	33-1027	Spring
95	21-1003	Cork Washers
96	27-1024	Main Drive Wheel Assembly
97	25-1523	Hub
98	1H52581FA1	Washer .266 I. D. x 1-3/4 O. D.
98A	25-1562	Fly wheel Halves
99	25-1509	Nut - Flexloc
101	27-1037	Idle Wheel & Bracket Assembly
102	25-1404	Brake Shoe - Metal (Part of Item 112)
102A	21-1107	Brake Shoe - Rubber (Part of Item 112)
103	27-2104	Brake Arm Support Assembly
104	27-1042	Brake Roller Assembly
105	1H25849FE6	Set Screw
106	33-1032	Nut
107	33-1004	Hairpin Clip
108	33-1003	Brake Spring
109	33-1046	Spring - Auxiliary
110	21-1079	Bumper - Solenoid
111	27-1071	Solenoid

RELEST
MODEL CIA

*Newly Added